

Thoen fault along the southeastern margin of the Lampang basin, Northern Thailand: its recent activity from topography and remote sensing interpretation

発表者 Wiwegwin Weerachat 地圏変遷科学(修士1年)

This research has been done to study characteristics of the Thoen fault along the southeastern margin of the Lampang basin, northern Thailand (figure 1). The Thoen fault zone can divide into 4 segments; Ban Mai, Doi Ton Ngun, Sop Prap and Thoen segments. This study is focused on Ban Mai, Doi Ton Ngun and Sop Prap segments (Figure 1). Remote sensing technique was utilized for interpreting lineament and precisely locating the fault. Aerial photographs were also used to interpret morphotectonic landforms. The results from Landsat 7 interpretation show that the major trend of lineaments along the Thoen fault is NE-SW direction and minor trend is NW-SE direction. Aerial photograph interpretation clearly reveals normal-fault scarps in the several areas along the fault trace such as Ban Mai, Ban Don Fai and Ban Samai Nuea areas. Morphotectonic landforms suggesting normal active faulting in these areas are triangular facets, wine glass canyons and linear mountain fronts. Geomorphic indices data that were used to analyze in this study consist of stream length-gradient index (SL), Ratio of valley floor width to valley height (Vf) and Mountain front sinuosity (Smf). All of parameters for geomorphic indices of active tectonic analysis are selected from 1:50,000 topographic maps. SL index can indicate steeper slope that may relate to active tectonic zone. SL index is calculated from gradient of the reach and total channel length (equation 1). Ratio of valley floor width to valley height (Vf) value which indicates the V shape of stream is calculated from equation 2. Mountain front sinuosity (Smf) that indicates uplift feature and erosional forces is calculated from equation 3.

$$SL = (H / L) * L \quad \dots (1)$$

SL = Stream length-gradient index.

H = Change elevation of reach.

L = Length of reach.

L = Total length channel from the point of interest to highest point of channel.

$$Vf = 2Vfw / ((Eld - Esc) + (Erd + Esc)) \quad \dots (2)$$

Vf = Ratio of valley floor width to valley height.

Vfw = Width of valley.

Eld = Elevation of left valley divide.

Erd = Elevation of right valley divide.

Esc = Elevation of valley floor.

$$Smf = Lmf / Ls \quad \dots (3)$$

Smf = Mountain front sinuosity.

Lmf = Length of mountain front along the foot of the mountain.

Ls = Straight line Length of mountain front.

The result of Stream length-gradient indices show steeper slope near the mountain front along the margin of basin. The valley floor width to valley height (Vf) and mountain front sinuosity (Smf) are low (Vf: 0.43-1.51 and Smf: 1.10-1.53). These geomorphic indices seem to support rapid uplift feature. From the (above) morphotectonic evidence and geomorphic indices, we recommend three areas (Ban Mai, Ban Don Fai and Ban Samai Nuea areas) for future excavation survey. Excavation survey in three areas at Ban Mai, Ban Don Fai and Ban Samai Nuea areas may be carried out in the future for confirmation whether it is active fault or inactive fault. TL dating or C-14 AMS will be determined as the age of fault movement.

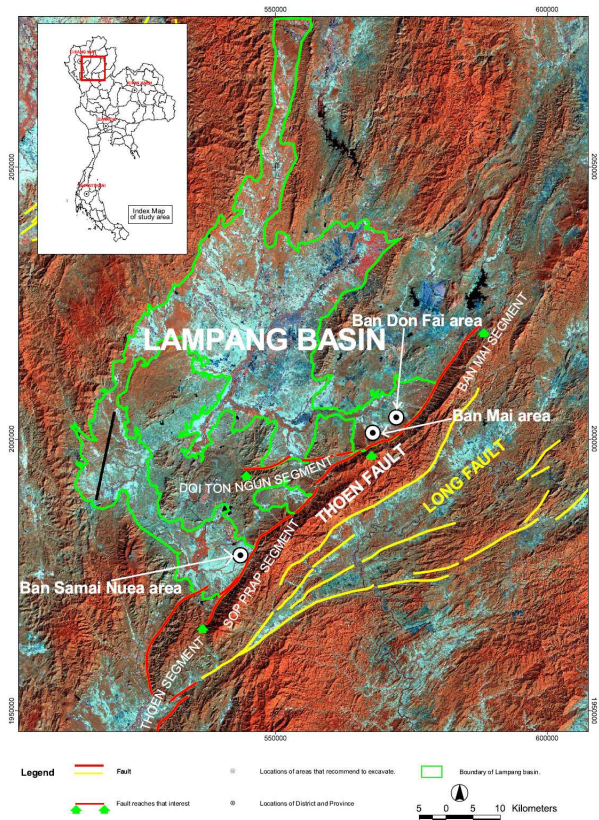


Figure 1. Locations of Lampang basin, Thoen fault (Red line) and the areas for future excavation survey (Ban Mai, Ban Don Fai and Ban Samai Nuea areas)

次回のお知らせ

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発表者: 下野 貴也 (地球物性科学 修士1年)
甘利 祐一 (地圏変遷科学 修士1年)

座長: 村岡 諭 (地球変動科学 修士2年)
篠崎 彩子 (惑星資源科学 修士2年)

連絡先

増川 恭子 (惑星資源科学 博士1年)
km9805@geol.tsukuba.ac.jp
西村 直樹 (地球変動科学 博士1年)
nisimura@geol.tsukuba.ac.jp
興野 純 (鉱物学)
kyono@geol.tsukuba.ac.jp